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L1	204	generat\$3 near3 outline and (2D or two adj dimensional\$1)and array and (area or volume or region)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/11/13 13:33
L2	172	1 and(filters or correct\$3 or error)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/11/13 13:34
L3	12	2 and(filters or correct\$3 or error)with mask	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/11/13 13:34
L4	7	3 and @ad<"20000229"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/11/13 13:35

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- ☐ Classification codes A: Physics, 8
- ☐ Classification codes A: Physics, 9
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6410714, B2000-01-6135C-020, C2000-01-5260D-005; 19991201.

Title

Extraction of moving objects for content-based video coding.

Author(s)Meier-T; Ngan-K-N.**Author affiliation**

Dept of Electr & Electron Eng, Western Australia Univ, Nedlands, WA, Australia.

Source

Visual Communications and Image Processing '99, San Jose, CA, USA, 25-27 Jan. 1999.

Sponsors: SPIE, Soc. Imaging Sci. & Technol.

In: Proceedings-of-the-SPIE-The-International-Society-for-Optical-Engineering (USA), vol.3653, pt.1-2, p.1178-89, 1998.

CODEN

PSISDG.

ISSN

ISSN: 0277-786X, CCCC: 0277-786X/98/ (\$10.00).

Availability

SICI: 0277-786X(1998)3653:1/2L.1178:EMOC; 1-1.

Publication year

1998.

Language

EN.

Publication type

CPP Conference Paper, J Journal Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

This paper considers video object plane (VOP) segmentation for the content-based video coding standard MPEG-4. MPEG-4 relies on a content-based representation to provide new functionalities. To take advantage of these functionalities, a prior decomposition of sequences into semantically meaningful, physical objects is required. We formulate this problem as one of separating foreground objects from the background based on motion information. For the object of interest, a **2D** binary model is derived and tracked throughout the sequence. The model points consist of **edge** pixels

detected by the Canny operator. To accommodate rotation and changes in shape of the tracked object, the model is updated every frame. These binary models then guide the actual VOP extraction. Due to the excellent **edge** localization properties of the Canny operator, the resulting VOP contours are very accurate. Both the model initialization and update stage exploit motion information. The main assumption underlying our approach is the existence of a dominant global motion that can be assigned to the background. Areas that do not follow this background motion indicate the presence of independently moving physical objects. **Two** methods to identify such objects are presented. The first one employs a **morphological** motion filter with a new filtering criterion that measures the deviation of the locally estimated optical flow from the corresponding global motion. The second method computes a change detection **mask** by taking the difference between consecutive frames. The first version is more suitable for sequences involving little motion, whereas the second version is stronger at dealing with fast moving objects. (18 refs).

Descriptors

code-standards; digital-filters; feature-extraction; image-motion-analysis; image-recognition; image-segmentation; image-sequences; mathematical-morphology; video-coding.

Keywords

moving objects; content based video coding; video object plane segmentation; VOP; content based video coding standard; MPEG 4; content based representation; functionalities; decomposition; sequences; semantically meaningful physical objects; foreground objects; motion information; **2D** binary model; Canny operator; **edge** pixels; rotation; tracked object; **edge** localization; VOP contours; initialization; update stage; global motion; independently moving physical objects; **morphological** motion filter; filtering criterion; locally estimated optical flow; change detection **mask**; consecutive frames; fast moving objects.

Classification codes

B6135C (Image and video coding).
B6135E (Image recognition).
B6140B (Filtering methods in signal processing).
C5260D (Video signal processing).
C1250M (Image recognition).

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6458275, B2000-02-6135C-044, C2000-02-5260D-037; 20000101.

Title

Video segmentation for content-based coding.

Author(s)

Meier-T; Ngan-K-N.

Author affiliation

Dept of Electr & Electron Eng, Western Australia Univ, Nedlands, WA, Australia.

Source

IEEE-Transactions-on-Circuits-and-Systems-for-Video-Technology (USA), vol.9, no.8, p.1190-203, Dec. 1999. , Published: IEEE.

CODEN

ITCTEM.

ISSN

ISSN: 1051-8215, CCCC: 1051-8215/99/ (\$10.00).

Availability

SICI: 1051-8215(199912)9:8L.1190:VSCB; 1-I

Electronic Journal Document Number: S1051-8215(99)09579-8.

Publication year

1999.

Language

EN.

Publication type

J Journal Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

To provide multimedia applications with new functionalities, the new video coding standard MPEG-4 relies on a content-based representation. This requires a prior decomposition of sequences into semantically meaningful, physical objects. We formulate this problem as one of separating foreground objects from the background based on motion information. For the object of interest, a **2D** binary model is derived and tracked throughout the sequence. The model points consist of **edge** pixels detected by the Canny operator. To accommodate rotation and changes in shape of the tracked object,

the model is updated every frame. These binary models then guide the actual video object plane (VOP) extraction. Thanks to our new boundary postprocessor and the excellent **edge** localization properties of the Canny operator, the resulting VOP contours are very accurate. Both the model initialization and update stages exploit motion information. The main assumption underlying our approach is the existence of a dominant global motion that can be assigned to the background. Areas that do not follow this background motion indicate the presence of independently moving physical objects. **Two** alternative methods to identify such objects are presented. The first one employs a **morphological** motion filter with a new filter criterion, which measures the deviation of the locally estimated optical flow from the corresponding global motion. The second method computes a change detection **mask** by taking the difference between consecutive frames. The first version is more suitable for sequences with little motion, whereas the second version is better at dealing with faster moving or changing objects. Experimental results demonstrate the performance of our algorithm. (26 refs).

Descriptors

code-standards; digital-filters; edge-detection; feature-extraction;
image-motion-analysis; image-representation; image-segmentation;
image-sequences; mathematical-morphology; video-coding.

Keywords

video segmentation; content based coding; multimedia applications; functionalities; video coding standard; MPEG 4; content based representation; decomposition; sequences; semantically meaningful physical objects; foreground objects; background; motion information; **2D** binary model; **edge** pixels; Canny operator; rotation; video object plane extraction; VOP extraction; **edge** localization properties; contours; model initialization; update stages; independently moving physical objects; **morphological** motion filter; filter criterion; change detection **mask**; moving objects; changing objects.

Classification codes

B6135C (Image and video coding).
C5260D (Video signal processing).

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7991201, A2004-14-6820-025; 20040613.

Title

Strain-driven instability of a single island and a hexagonal island array on solid substrates.

Author(s)

Ni-Y; He-L-H; Song-J.

Author affiliation

Dept of Modern Mech, Univ of Sci & Technol of China, Hefei, China.

Source

Surface-Science (Netherlands), vol.553, no.1-3, p.189-97, 20 March 2004. , Published: Elsevier.

CODEN

SUSCAS.

ISSN

ISSN: 0039-6028, CCCC: 0039-6028/04/ (\$30.00).

Availability

SICI: 0039-6028(20040320)553:1/3L.189:SDIS; 1-E.

Publication year

2004.

Language

EN.

Publication type

J Journal Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

Ordered arrays of **two-dimensional (2D)** strained islands on a solid surface have been generated recently by **mask** deposition or self-organization. Their feature sizes and shapes can be controlled in a broad way. Due to the competing effect of **edge** energy of islands and elastic energy caused by misfit strain, the **morphological** stability of such ordered island arrays becomes a critical issue. In this paper, we show, by a linear stability analysis, that an isolated circular island may undergo shape transition of various modes which are determined by the island size. We also perform a dynamical simulation for the **morphological** evolution of a hexagonal array of circular islands based on a continuum phase-field model. Numerical results indicate that long-range elastic interaction between islands mediated through the underlying substrate can significantly influence island shape. The

hexagonal island array can be either stable or unstable, critically depending on the initial radius and spacing of the islands as well as the amplitude of thermal fluctuation localized at the island **edge**. (32 refs).

Descriptors

internal-stresses; island-structure; numerical-analysis; solid-state-phase-transformations; stress-effects; surface-morphology.

Keywords

strain driven instability; hexagonal island array; solid substrates; **two** dimensional strained islands; solid surface; **mask** deposition; self organization; **edge** energy; elastic energy; misfit strain; **morphological** stability; ordered island arrays; linear stability analysis; isolated circular island; shape transition; island size; **morphological** analysis; circular islands; continuum phase field model; long range elastic interaction; island shape; thermal fluctuation; island **edge**.

Classification codes

A6820 (Solid surface structure).

A6470K (Solid-solid transitions).

A8130H (Constant-composition solid-solid phase transformations: polymorphic, massive, and order-disorder).

A0260 (Numerical approximation and analysis).

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<http://dx.doi.org/10.1016/j.susc.2004.01.051>.

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